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Health of Native-born and Foreign-born Black Residents in the United States: Evidence from the 2000 Census of Population and the National Health Interview Survey

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Abstract

Utilizing the 5% Public Use Micro Data Sample (PUMS) from the 2000 Census of Population and 2000-2006 waves of the National Health Interview Survey (NHIS), we examine differences in disability, self-rated health and chronic conditions among native-born and foreign-born black US residents. Among the foreign-born, we distinguish among immigrants from the Caribbean /West Indies, Africa, Europe and other regions of the world, as well as by Hispanic origin. Results from both data sets point to an immigrant health advantage across all measures of health for all groups except for the European-born. Black immigrants from Europe reported similar levels of hypertension as U.S.-born non-Hispanic blacks. Our results also suggest that the Hispanic health "paradox" does not apply to Hispanics who self-identify as black.

Since the mid-1960s, the United States has witnessed a large increase in its foreign-born population, including an ever-increasing diversity among recent immigrants (Massey 1995, Alba and Nee 2003). Between 1990 and 2000 alone the number of foreign-born US residents increased by over 50% - from 19.8 million to 31.1 million. In 2000, the foreign-born represented about 11% of the total US population with the percentage being much higher in some states such as California (26%) and New York (20%) (Malone et al. 2003). With an increasing number of immigrants arriving from Latin America, Asia, the Caribbean, West Indies, and Africa, the United States is becoming a more racially and ethnically heterogeneous society. By 2030, the non-Hispanic white share of the total US population is estimated to decline to less than 60% (U.S. Census Bureau 2004).

Few individuals of African-origin immigrated to the United States between 1800 and 1960 when US immigration laws limited the entry of nonwhites (Massey 1995; Kent 2007). After the passage of the new immigration law in the mid-1960s, however, the number of black immigrants began to increase substantially. These new immigrants constitute a rapidly growing share of the US black population. In 1960, foreign-born blacks made up less than one percent of the US black population, by 2000 their share had increased to about 6 percent, and by 2005 it was 8 percent (Malone et al. 2003; Kent 2007).

With the growth of the foreign-born population, there is increasing interest in the health status of immigrants and their current and future contribution to the health of the U.S. population as a whole (Jasso et al. 2004). Yet it has been difficult to examine the health of foreign-born US residents due to sample size constraints in national health surveys and a lack of detailed information on national origin and immigration status in many data sources (Kandula, Kersey, and Lurie 2004). In this paper, we take advantage of the expanded questions on disability included in the 2000 Census of Population to investigate disability among native and foreign-born black US residents. The size of the 5% Public Use Microdata

Sample (PUMS) of the 2000 census also makes it possible to disaggregate the black foreign-born population by place of birth. Although the 2000 census provides relatively large sample sizes, it is limited in health measures and we complement the census analysis with pooled data from the 2000-2006 waves of the National Health Interview Survey (NHIS). These data allow us to analyze more general health endpoints (e.g., self-rated health and self-reported chronic disease) as well as examine the mediating role of health behaviors.

BACKGROUND

The immigrant subgroup and its native-born counterpart that has received the most attention in the literature to date is the Hispanic population of the United States. This focus stems at least in part from the fact that Hispanics are the largest immigrant ethnic group, data availability, and the scientific interest in the Hispanic health paradox (Jasso et al. 2004; Markides and Eschbach 2005). A few studies have also examined health among other immigrant groups, and most have documented better health and lower adult and infant mortality among foreign-born whites, blacks, and Asian and Pacific Islanders than among their native-born counterparts or among native-born whites (e.g., David and Collins 1997; Elo and Preston 1997; Hummer et al. 1999a, 1999b; Frisbie, Cho, and Hummer 2001, Jasso et al. 2004; Singh and Siahpush 2002). Among US black residents, infants of foreign-born black women are less likely to be born preterm, low birth weight or die in their first year of life (David and Collins 1997; Singh and Yu 1996; Hummer et al. 1999b). In addition, all cause mortality appears to be lower among black immigrants than their native born counterparts (Hummer et al. 1999a), including mortality from several leading causes of death such as cardiovascular diseases, cancer, and respiratory diseases (pneumonia, influenza, and chronic obstructive pulmonary disease) (Singh and Siahpush 2002). Based on information drawn from various waves of the National Health Interview Survey (NHIS), studies have also documented lower rates of activity limitation, less bed disability days, and better self-rated

health status among foreign-born blacks than native-born blacks (Cho, Frisbie, and Rogers 2004; Read and Emerson 2005).

Unlike studies of Hispanics, which have examined variation in health outcomes among various Hispanic subgroups (Mexicans, Cubans, Puerto Ricans, other foreign-born, and native-born Hispanics) (e.g., Cho et al. 2004), most studies of Asian, non-Hispanic white, and black immigrant health and mortality have ignored subgroup heterogeneity. One recent exception is a study by Mutchler, Prakash, and Burr (2007), in which the authors examined disability among elderly Asian immigrants by country of origin also utilizing the 5% PUMS data from the 2000 census. Their results show considerable subgroup heterogeneity in disability among the elderly, measured by difficulty going outside alone and limitations in physical activity and in the performance of self-care tasks (see also Cho and Hummer 2001). Only one study has investigated subgroup variability in health outcomes among foreign-born blacks in the U.S. (Read and Emerson 2005). The results of this investigation, based on the 2000-2002 waves of the NHIS, suggest that black immigrants from Africa and the West Indies have superior health compared to native-born blacks and to black immigrants from Europe whose health appears to be similar to that of U.S. born blacks.

The above studies of native and foreign-born blacks focus primarily on non-Hispanic blacks and studies of Hispanics do not distinguish Hispanics by race. This convention is at least in part related to the fact that Hispanics largely disregard the traditional US concept of race, and frequently choose “other race,” other than white, black/African American, native American or Asian, when asked about their racial identity (Campbell and Rogalin 2006; Hitlin, Brown and Elder 2007; Landale and Oropesa 2002). For example, in the 2000 US Census of Population, over 40% of Hispanics self-identified as “other race” and only about two percent as “black/African American,” with nearly all of the remainder self-identifying as “white” (Grieco and Cassidy 2001).

Hispanics who self-identify as “black” may do so for a variety of reasons. These include the fact that they have a non-Hispanic black parent (Logan 2004), phenotype/skin color (Rodriguez 2000) or that identification with a “black” identity reflects life experiences (Hitlin, Brown, and Elder 2007). Nevertheless, Hispanic blacks are a distinct subgroup within the Hispanic population. Compared to Hispanics who identify as “other” or “white”, Hispanic blacks are more racially segregated from whites and more likely to live in neighborhoods with non-Hispanic Blacks (Denton and Massey 1989). Hispanic blacks also have a lower median household income, higher unemployment, and a higher poverty rate than other Hispanics (Logan 2004). Therefore, regardless of the underlying motivations for identifying as “black,” there seems to be measurable differences in social characteristics between this subgroup and other Hispanics that may translate into a distinct health pattern.

Moreover, little is known about the health status of foreign-born Hispanic blacks. Among them, the largest group (approximately 30%) is from the Dominican Republic. The number of immigrants from the Dominican Republic approximately doubled between 1990 and 2000 and they currently constitute the fourth-largest immigrant group from Latin America (Grieco 2004). Other major sending countries for foreign-born Hispanic blacks are Panama and Mexico, each contributing about 15% (authors’ tabulations based on the 2000 Census of Population 5% IPUMS sample, see Ruggles et al. 2004). Whether foreign-born Hispanic blacks resemble the health status of non-Hispanic foreign-born blacks from the Western Hemisphere has not been previously addressed.

Explanations of better immigrant health outcomes

The most common explanations for better health status and lower mortality of the foreign-born compared to the native-born US residents are based on theories of selective migration and “cultural buffering” (Cho et al. 2004, Jasso et al. 2004). Immigrants to the U.S. and elsewhere do not represent a random sample of the population in their country of origin;

instead they consist of a select group of healthy individuals. Health selection is thought to be especially strong at working ages when individuals are most likely to migrate for economic reasons (Marmot, Adelstein and Bulusu 1984; Palloni and Ewbank 2004; Sharma, Michalowski and Verma 1990), and when monetary and non-monetary costs of migration are high, e.g., from countries located further away from the United States (Jasso et al. 2004). Although it is difficult to gage the extent of health selection among US immigrants, available evidence suggests that it is extensive and is likely to vary by country of origin (see Jasso et al. 2004 for a detailed discussion).

The "cultural buffering" hypothesis in turn postulates that "other cultures compared to the United States are more likely to be characterized by norms and values that restrain risky behaviors (smoking, abuse of alcohol and drugs) and promote stronger familial and social support networks" (Cho et al. 2004:189). Once in the United States, however, acculturation to the US environment is hypothesized to lead to negative changes in health behaviors and diet and erode social and familial ties (Angel, Buckley, and Sakamoto 2001; Amaro et al. 1990; Hummer et al. 1999a; Mutchler et al. 2007). That the health advantage of the foreign-born relative to the US-born population narrows with a longer duration of US residence is typically cited in support of this hypothesis (Cho et al. 2004).

In addition, migration itself may have health consequences. It disrupts social ties and at least temporarily can lead to diminished social networks and access to emotional and instrumental social support and increase the level of stress (Angel et al. 2001; Jasso et al. 2004; Kasl and Berkman 1983). Black immigrants may experience particularly high levels of stress as they face prejudice and discrimination in the racially stratified US society that is distinct from environments in their countries of origin. Many black immigrants reside in racially segregated communities, although Caribbean-born blacks are more likely to reside in neighborhoods with native-born blacks than are black immigrants from Africa (Logan and

Deane 2003). To the extent that racial residential segregation adversely affects health, (Willians and Collins 2001; Acevedo-Garcia and Lochner 2003) we would expect differences in neighborhood environments to contribute to variations in health outcomes by place of birth.

Although racial stratification in the United States serves as an important contextual experience for foreign-born blacks, racial context in the country of origin may also have long-term health consequences (Read and Emerson 2005). Black immigrants from minority white regions, where they have not been subjects to the effects of racism, have been hypothesized to have superior health compared to those from majority white regions, where blacks have lived in environments similar to that of the United States and whose health as a consequence is comparable to that of US-born black residents. Read and Emerson (2005) found some support for this hypothesis from their study of black immigrant health by region of origin.

The vast majority of blacks come to the United States from the West Indies/Caribbean and from Africa, although relatively few Africans arrived prior to 1980 and most have come since 1990 (Kent 2007). In contrast, the immigrant flow from the Caribbean has been relatively steady during the last three decades of the 20th century, in part due to the islands' proximity to the United States. Those arriving from the Caribbean continue to make up the largest share of black immigrants, 60% in 1990-1999, followed by those arriving from Africa (36%) (Kent 2007). Black immigrants from Europe and elsewhere make up a very small fraction of black immigration to the U.S. Characteristics of black immigrants also vary by region of origin. For example, Africans are on average more highly educated and they are more likely to enter the United States on diversity visas and on employment based preferences than other black immigrants. In contrast, those coming from the Caribbean in recent years are more likely to arrive as family members of US citizens or on other family-

sponsored visas (Read and Emerson 2005; Kent 2007). Thus among recent immigrants health selectivity is likely to be less pronounced among immigrants from the Caribbean than Africa.

In this paper, we extend previous research on the US black immigrant population by examining variation in disability, self-rated health, and self-reported chronic conditions among black immigrant subgroups and in comparison to the US-born black population. Strength of our approach is the comparison of differentials across a wide-range of health outcomes, thereby providing a broad portrayal of the health status of foreign-born blacks. Unlike prior studies we also include Hispanics who self-identified as black/African American. As noted above, variation in immigrant selectivity is hypothesized to be an important determinant of sub-group health heterogeneity. We hypothesize that socioeconomic determinants (e.g., educational attainment), demographic characteristics (e.g., age, sex, marital status), and health behaviors (e.g., smoking) will explain health differentials among the foreign-born black subgroups and substantially reduce the differentials between the native-born and the foreign-born. In addition, given differences in the timing of immigration among the foreign-born, we further speculate that age and year of immigration will help explain variation in health outcomes among the foreign-born.

CENSUS DATA

We use the 5% PUMS of the 2000 Census of Population which, due to its large sample size, facilitates analyses of small race/ethnic groups by place of birth. We include individuals ages 25 and above who self-identified as black/African American or black/African American and some other race, a strategy similar to that used in other studies to classify multi-race individuals (Tucker et al. 2002; Mutchler et al. 2007).[1] The 2000 census was the first census that permitted multiple race reporting. Approximately, 36.4 million individuals, 12.9% of the US population, self-identified as black/African American (95% of the total) or black/African

[1] We exclude individuals for whom racial identity was imputed by the Census Bureau (N=19,458). Imputations were more frequent for Hispanics than non-Hispanics.

American in combination with at least one other race (5%) (Grieco and Cassidy 2001). In addition to the race question, the census included a separate question on Hispanic origin. In 2000, 35.3 million individuals (12.5% of the US population) classified themselves as Hispanic, of whom approximately two percent were black/African American (Ibid.). The unweighted sample size from the 5% PUMS is 917,728 non-Hispanic and Hispanic black US residents ages 25 and above in 2000.

Census Measures of Disability

The 2000 census included an expanded set of questions on disability, which were considered an improvement over questions in prior censuses. One cluster of questions asked about long lasting functional limitations involving vision, hearing and physical disability, and the second cluster focused on difficulty in performing certain activities due to a physical, mental, or emotional condition. Taken together these questions capture loosely defined sensory, physical, mental, self-care and employment disability and difficulty going outside the home for shopping or to a doctor (Waldrop and Stern 2003). In this paper, we focus on physical disability and self-care disability, which are measured by the following two questions: *physical disability* – " does this person have any of the following long-lasting conditions -- a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying;" *self-care disability* – "because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities: dressing, bathing, or getting around inside the home." Although these measures are far less detailed than those commonly collected in health surveys such as the National Health Interview Survey (NHIS) (http://www.cdc.gov/nchs/nhis.htm) or the Health and Retirement Study (http://hrsonline.isr.umich.edu/), they are related to commonly used measures of functional limitations and activities of daily living (ADL). Specifically, physical disability consists of Nagi-like scale items of functional

limitations (Nagi 1991), and the self-care disability assesses difficulty in performing a subset of basic tasks included in the Katz measure of ADL (Katz 1963). Similar disability indicators from the 2000 census were used in the study of disability among elderly Asian subgroups (Mutchler et al. 2007). Both dependent variables are coded 1 for persons with disability and 0 otherwise. We chose not to include the other disability items because they are more easily subject to language or cultural barriers (such as visiting a doctor's office). In addition, a recent study identified inconsistencies in the estimates of "employment disability" and "go-outside-home" disability based on the 2000 census and the Census 2000 Supplementary Survey (C2SS), a national sample based on the American Community Survey (ACS). For the two disability items used in this paper the two sets of estimates were very similar (Stern 2003).

NATIONAL HEALTH INTERVIEW SURVEY (NHIS) DATA

The NHIS is an annual nationally representative cross-sectional household survey of the US civilian non-institutionalized population administered by the National Center for Health Statistics (NCHS) ((http://www.cdc.gov/nchs/ nhis.htm). We pool data from the 2000-2006 adult sample files to increase sample size for analyses of the foreign-born population by region of birth. Beginning in 2000, the NHIS began to collect information on place of birth among the foreign-born. The survey also obtains information on demographic and socioeconomic characteristics of the respondents, including race and Hispanic origin, which is comparable to that available in the 2000 census. Since 1997, the sample adult core questionnaire administered to a randomly selected adult (18 years old or over) in each family, has collected data on smoking, whether the respondent had ever been told that they had select chronic conditions, and height and weight. Information on self-rated health is available from the core questionnaire. The unweighted pooled sample from the 2000-2006 NHIS adult files consists of 24,980 non-Hispanic and Hispanic black US residents ages 25 and above. We

dropped 2,625 cases due to missing information on either the outcomes or the explanatory variables of interest. All data were extracted from the Integrated Health Interview Survey website located at the University of Minnesota (http://www.ihis.us/ihis/).

NHIS Health Outcomes

We include four health outcomes in the analyses of the NHIS data to examine the consistency of findings across multiple indicators of health. The first outcome is a measure of limitations in physical activities which captures the range of activities included in the census question on physical disability. The outcome was coded 1 if the respondent indicated having any difficulty in performing any of the following activities without special equipment – walking a ¼ mile, climbing 10 steps, reaching over head, or carrying 10 pounds – and 0 otherwise. We measure the presence of chronic health conditions by two outcomes: whether the respondent had ever been told by a doctor or other health professional that they have hypertension, and whether the respondent had ever been told by a doctor or another health professional that they had any of the following chronic conditions – cancer, coronary artery disease, heart disease, heart attack, diabetes, stroke, or emphysema. Our measure of overall self-rated health is based on the widely used question on whether the respondent rated their health as excellent, very good, good, fair or poor. We code this variable as 1 if the respondent rated their health as fair or poor, and 0 if they rated their health as good, very good, or excellent.

Explanatory Variables

We distinguish among several black immigrant subgroups and compare their health to that of non-Hispanic and Hispanic US-born black residents. Because of the considerable heterogeneity among black immigrants, we further distinguish foreign-born non-Hispanic blacks by place of birth. More specifically, we distinguish among seven population subgroups using information on race, Hispanic origin and place of birth: native-born non-Hispanic blacks; native-born Hispanic blacks (those born in the mainland US or Puerto Rico); foreign-

born Hispanic blacks; non-Hispanic blacks born in West Indies/Caribbean;[2] non-Hispanic blacks born in Africa; non-Hispanic blacks born in Canada/Europe; and other foreign-born non-Hispanic blacks.[3]

We also examine disability by period of entry and age at entry to the United States among the foreign born, factors that have been linked to variation in health status in prior studies (Angel et al. 2001; Cho et al. 2004; Read and Emerson 2005; Landale, Oropesa and Gorman 2000; Singh and Miller 2004). Based on recent immigration patterns of blacks to the United States we identify three time periods of entry: before 1980, 1980-1989, and 1990-2000. We categorize age at entry as less than 20 years (childhood and adolescence), ages 20-54 (young adulthood and working ages) and ages 55 and above (middle and older ages). Based on results from prior studies we hypothesize that a longer duration of US residence is associated with a higher level of disability. We further speculate that those who immigrated during working ages have lower disability than those who arrived as children or adolescents or at ages 55 and above because those who immigrated during working areas are likely to be more highly selective on better health (Jasso et al. 2004).

In addition to place of birth, age at immigration and year of immigration we control for current age (in single years) and sex. Because there is considerable variation in educational attainment and marital status between native-born and foreign-born blacks and among the foreign born by place of birth (Read and Emerson 2005; Kent 2007), we include marital status and educational attainment as explanatory variables. Educational attainment and marital status has been closely associated with health behaviors and health status, including disability, in prior studies (Lillard and Waite 1995; Preston and Taubman 1994; Freedman and Martin 1999; Hayward et al. 2000). Furthermore, education is acquired relatively early in

[2] In the census data, this category also includes Guyana because it shares a similar colonial and cultural history with other British West Indian nations. In the NHIS data, the category also includes other countries in Central and South America, which are all grouped together in this data source.

[3] In the NHIS, the Canada/Europe category is restricted to Europe, including Russia, and the last category is dropped due to very small sample size.

life and it is less subject to reverse causality than income which is measured concurrently with disability (Smith 2005). Educational attainment is coded as less than high school, high school or GED, some college, a college degree, and a graduate or a professional degree, and marital status as never married, currently married, separated/divorced or widowed. There are also large differences in the settlement patterns of black immigrants to the United States by place of birth. For example, Caribbean-born blacks live mainly on the East Coast while African-origin immigrants are more widely dispersed (Kent 2007). Thus we also control of region of residence coded as Northeast, Midwest, South and West.

In the analyses of the NHIS data, we also examine whether differences in health behaviors contribute to variation in health outcomes among the native and the foreign-born. We include smoking because it is a key risk factor and its prevalence varies by race/nativity and sex (Burns, Lee and Shen 1997; Lucas, Barr-Anderson and Kington 2005: Singh and Siahpush 2002). In addition, we include obesity as a health-related state that may contribute to our understanding of health differentials between native- and foreign-born groups. Obesity is strongly linked to higher levels of functional disability (Alley and Chang 2007), ADL limitations (Himes 2000; Reynolds, Saito, and Crimmins 2005; Al Snih et al. 2007; Alley and Chang 2007) as well as prevalent chronic conditions including heart disease (Field et al. 2001), diabetes (Field et al. 2001), hypertension (Himes 2000; Field et al. 2001, and some cancers (National Cancer Institute 2004). Immigrants generally enter the United States with lower BMI (Body Mass Index, kg/m^2) compared to their race concordant native-born group (Antecol 2006), which may be an indicator of their favorable health status at time of immigration. However, with increasing stay in the United States immigrants tend to experience increasing weight status often approaching native-born levels (Antecol 2006; Goel et al. 2004).

STATISTICAL METHODS AND ANALYTIC STRATEGY

We estimate a series of logistic regression models predicting the presence of physical activity limitation, self care limitation, poor/fair self-rated health, hypertension, and other serious medical conditions. All models are estimated in STATA 10 (Stata Corporation 2007), and all results are presented as odds ratios. All estimates based on the NHIS take account of its complex survey design.

We begin with an analysis of the Census data and compare disability prevalence among native born Hispanics and the foreign-born subgroups relative to native-born non-Hispanic blacks and by examining effects of age at immigration and year of immigration. We test for subgroups differences in disability prevalence controlling only for age and sex (Model 1) and whether these subgroup differences are explained by educational attainment, marital status and region of residence, and among the foreign born by age at immigration or year of immigration (Model 2). We then analyze the NHIS data to examine the consistency of findings between the two data sources in the case of physical activity limitation and whether differences in other health outcomes are similarly patterned by nativity/place of birth.

RESULTS - 2000 CENSUS OF POPULATION

Table 1 presents sample characteristics based on the 5% PUMS 2000 Census file. Native-born non-Hispanic blacks made up approximately 90%, Hispanic blacks about one percent, and the foreign-born blacks about eight percent of all US black residents ages 25 and above in 2000. Among the foreign-born, those immigrating from the West Indies/Caribbean accounted for about 70% of all black immigrants, followed by Africans, foreign-born Hispanics, European/Canadians and all others.

Both functional disability and self-care disability varied among these population subgroups with African immigrants reporting the lowest level of both physical activity limitation (3.6%) and personal care limitation (1.3%) with the highest levels found among the

native-born non-Hispanic blacks (15.2% and 5.7%, respectively) and native-born Hispanic blacks (14.4% and 5.9%, respectively). African immigrants had the highest level of education, among whom 48% had at least a college degree, followed by black immigrants from Europe/Canada (44%). In contrast, only about 19% of foreign-born Hispanic black immigrants, 22% of native-born Hispanic and 20% of native-born non-Hispanic blacks had an equivalent level of education. Immigrants from Africa were also younger, more likely to be male and married than the other immigrant groups or the native-born. Lowest marriage rates were found among native-born Hispanic and native-born non-Hispanic blacks. The regional distribution of the black subgroups reflects the settlement patterns of the native-born and foreign-born black US residents (Table 1).

There were also substantial differences in age at immigration and year of immigration among the foreign-born. For example, over 50% of black immigrants from Africa had arrived in the U.S. after 1990. In contrast, close to 60% of black immigrants from Europe/Canada had migrated prior to 1980. Furthermore, over 60% of these European/Canadian immigrants came as children or adolescents (ages < 20 years) compared to only about 15% of African immigrants. The age pattern of immigration and the year of immigration were more similar among the other immigrant groups.

Table 2 shows the results from the logistic regression models comparing physical activity limitation and personal care limitation among native-born Hispanic blacks and the foreign-born subgroups to that of native-born non-Hispanic blacks. It also shows estimated odds ratios for age at immigration and year of immigration among the foreign-born relative to the native-born. As seen in Model 1, Table 2, all foreign-born subgroups report a significantly lower level of physical activity limitation than native-born non-Hispanic blacks adjusting only for age and sex. Among the foreign-born, African immigrants report a significantly lower level of physical activity limitation than all other foreign-born subgroups

followed by immigrants from the West Indies/Caribbean whose disability level in turn is significantly lower than among foreign-born black Hispanics, and non-Hispanic black immigrants from Europe/Canada and other countries.[4] In contrast, native-born black Hispanics report a significantly higher level of physical activity limitation than native-born non-Hispanic blacks. Additional adjustment for educational attainment, marital status, and region of residence does not change the results substantively, although the group differences are reduced in magnitude.

We also find significant effects for age at immigration on physical activity limitation. However, regardless of age at immigration, black immigrants report lower prevalence than native-born blacks, and those who migrated at working ages have the lowest prevalence with or without adjustment for education, marital status and region of residence (Table 2). Similarly, regardless of year of immigration, immigrants report lower prevalence of physical activity limitation than the native-born. However, black immigrants who migrated in more recent years report significantly lower levels of physical activity limitation than those who came in the more distant past.

The subgroup differences in personal care limitations are broadly comparable to those discussed above. The major difference is that personal care limitations are not significantly different between black immigrants from Europe/Canada and the native-born non-Hispanic blacks. The results for age at immigration and year of immigration are similar for the two disability outcomes.

Results in Table 3 are based on black immigrants only. Compared to immigrants from the West Indies/ Caribbean, only immigrants from Africa report a significantly lower level of physical activity limitation controlling only for age and sex. This advantage disappears, however, in Models 2 and 3, which also adjust for education, marital status and region of

[4] To test for significant differences among subgroups, we use the Wald test as implemented in STATA 10, which is similar to the likelihood ratio test (results not shown).

residence, and age at immigration (Model 2) or year of immigration (Model 3). Thus the differences observed in Table 2 between African and West Indies/Caribbean immigrants is explained by differences in age at immigration and year of immigration to the United States. In contrast, other black immigrants, i.e., foreign-born Hispanics, those immigrating from Europe/Canada or from other countries, report significantly higher levels of physical activity limitation than immigrants from the West Indies/ Caribbean or from Africa. Furthermore, these differences are not explained by our socio-demographic controls, age at immigration or year of immigration.

The results from models predicting personal care limitations among the foreign born are similar to those for physical activity limitation in Model 1 with controls for age and sex only. However, adjustment for socio-demographic characteristics and age at immigration or year of immigration explains most of the differences among the black immigrant subgroups. The major exception is the result for black immigrants from Europe/Canada, who continue to show a significantly higher level of personal care limitations than the other black immigrant groups in the fully adjusted models (Table 3; Models 2 and 3). In addition, immigrants who migrated as children or who arrived prior to 1990 report significantly higher personal care limitations than those who came at older ages or after 1990.

RESULTS – NATIONAL HEALTH INTERVIEW SURVEY (NHIS)

The distribution of health outcomes by subgroup is shown in Table 4 and sample characteristics are given in Appendix Table 1. Non-Hispanic native-born blacks were most likely to report fair/poor self-reported health and they had the highest prevalence of hypertension, serious medical conditions and physical activity limitations, followed by native-born Hispanic blacks, except for hypertension. There was some variability in the rank ordering of the other population subgroups by health outcome, with African and European-origin groups generally reporting better health than the others with the exception of

hypertension whose prevalence was relatively high among the European immigrants. The distribution of the sample by socio-demographic characteristics is generally similar to the census sample, with the differences reflecting the exclusion of the institutionalized in the NHIS and small sample sizes for some subgroups. Regarding health behaviors, over 80% of the foreign-born, except those from Europe, had never smoked cigarettes, compared to about 70% of the European immigrants and just under 60% of the native born Hispanic and non-Hispanic blacks. Similarly, the non-European black immigrants were least likely to be obese, followed by European-origin and native-born blacks.

Table 5 shows the multivariate regression results. With respect to physical activity limitation, the results were broadly similar to those based on the census data. Native-born Hispanic blacks reported greater physical activity limitations than the native-born non-Hispanic blacks, although the difference did not reach statistical significance in the NHIS. The other immigrant subgroups reported significantly less physical activity limitations than the native-born Hispanic or non-Hispanic blacks. The main difference from the census results was the low point estimate for European-origin blacks. The subgroup differences were attenuated with the introduction of socio-demographic characteristics (Model 2) and they were further reduced with adjustment for smoking and obesity. However, the inclusion of these characteristics did not explain the lower reported prevalence of activity limitations among the foreign-born.

The results were similar for poor/fair self-rated health and serious medical conditions as for physical activity limitation, but they differed for hypertension. Native-born Hispanic blacks reported significantly less hypertension than the native-born non-Hispanic blacks. Similarly, all immigrant subgroups reported significantly less hypertension than the native-born non-Hispanic blacks, except for black immigrants from Europe whose reported

prevalence of hypertension did not differ significantly from that of the native-born non-Hispanic blacks.

DISCUSSION

Foreign-born immigrants make up a growing proportion of the US population who self-identify as black/African American. Until recently relatively little has been known about the health status of these foreign-born residents. In this paper, we utilize data from the 2000 Census of Population and the National Health Interview Survey (NHIS) to investigate physical and personal care limitations, self-rated health, hypertension and major medical conditions among black US residents by nativity and by place of birth among the foreign-born. Consistent with previous studies, we find that black immigrants had significantly better health than the native-born on most health measures examined, although the relative advantage varied among the foreign-born subgroups and by health outcome. Unlike most prior studies of foreign-born blacks, an important advantage of this study is that we were able to analyze a relatively large sample of foreign-born blacks utilizing the 2000 Census data that is not possible with survey data. Moreover, analyses based on the 2000-2006 NHIS data generally confirmed patterns revealed in the census and made it possible to examine the role of health behaviors.

Utilizing data from the 5% PUMS file of the 2000 Census, we found that all foreign born subgroups reported significantly lower prevalence of physical activity limitations than the native-born non-Hispanic blacks and that their better health status was not explained by age, sex, educational attainment, marital status or place of residence. Among the foreign born, immigrants from Africa had the lowest prevalence of physical activity limitations while immigrants from Europe/Canada had the highest. Black immigrants from Africa are the most recent arrivals and over 80% of them came at ages 20-54, a much higher percentage than among any other immigrant subgroup. They are also the most highly educated black

immigrants, and they represent a highly select group of individuals from their countries of origin. Nevertheless, adjustment for socio-demographic characteristics and year of immigration or age at immigration did not explain their lower level of physical activity limitation compared to other immigrant subgroups, except in comparison to black immigrants from West Indies/Caribbean. The results based on the Census data for personal care limitations were broadly similar.

Read and Emerson (2005), based on similar results from the 2000-2002 waves of the NHIS data, theorized that black immigrants migrating from majority white regions (Europe) experienced worse health status than immigrants from minority white regions (Africa, West Indies/Caribbean) because of their exposure to a similar racists environment than that found in the United States. Our findings based on the census data confirm that black immigrants from majority white regions of the world (most were born in Europe) reported more physical and personal care limitations than the other foreign-born groups adjusting for age, sex, educational attainment, and marital status, region of residence and year and/or age of immigration. Exposure to majority white contexts in the sending country may have a detrimental effect on health for immigrant blacks. However, alternative explanations are also possible. A further inspection of the census data reveal that a sizable fraction of black immigrants from Europe came from Germany and England, arrived in the US prior to 1980 as children or adolescents and that close to 40% of all European black immigrants were born to US parents living abroad. Thus we would argue that the experiences of black immigrants from Europe are more closely tied to the experiences of native-born blacks because they are the sons and daughters of US residents, rather than to their exposure to racist European environments. European-born blacks may also experience less barriers to US immigration compared to those arriving from poorer regions of the world and therefore be a less selected group. In fact, we find that although these immigrants from Europe have more physical

activity limitations than other immigrant subgroups in the fully adjusted model they nevertheless appear to be somewhat better off than the native-born blacks. Furthermore, except for hypertension the point estimates for the health outcomes in the NHIS were similar for the European-origin blacks to those for the other foreign-born subgroups, although due to their small sample size these effects were imprecisely estimated.

More generally the results based on the NHIS were similar to the census results with foreign-born subgroups experiencing better health outcomes on nearly all health measures examined with the exception of hypertension as noted above. Adjustment for socio-demographic characteristics, smoking and obesity attenuated the foreign-born advantage and reduced the differences among the foreign-born subgroups. Thus at least a fraction of the health advantage of the foreign-born can be attributed to their less disadvantaged socioeconomic profile, lower rates of smoking and lower levels of obesity.

Like previous studies, we found better health among recent immigrants than those who migrated in the more distant past. Many authors have interpreted this result as evidence of the fact once in the US immigrants adapt to the US environment and they embrace behaviors that have detrimental health consequences. However, this interpretation is based on the premise that individuals who migrated in the more distant past are similar to the more recent migrants with respect to their heath at the time of migration. It is possible that the health status or health selectivity of migrants has changed over time. For example, Jasso et al. (2004) show that even over short periods (e.g., 5 years) the health status of newly arrived immigrants can vary. This finding suggests that interpretation of duration of US residence effects based on a single cross-section of data is not straightforward, a fact that has not been addressed in all prior studies on immigrant health.

Although there is ongoing interest in the Hispanic health “paradox,” there is less work on Hispanics who also self-identify as black. As noted earlier, self-identified Hispanic blacks

are a small but distinctive group with respect to economic status and residential patterns in that they are more similar to non-Hispanic blacks than to Hispanics who do not self-identify as black (Logan 2004). Our results suggest that the health status of native-born Hispanic blacks is also quite similar to native-born non-Hispanic blacks. In fact, native-born Hispanic blacks reported higher levels (20% to 40%) of physical activity limitation in the 2000 Census than native-born non-Hispanic blacks. Native-born Hispanic blacks did show a significantly lower level of hypertension (about 50% less) compared to the native-born non-Hispanic group, a finding that warrants further research. Our results challenge the notion that the Hispanic health "paradox" applies to all Hispanic subgroups. Past research also suggests that the Hispanic "paradox" is applicable only to certain Hispanic subgroups based on place of origin or descent (such as foreign-born Mexican Americans, see Palloni and Arias 2004). Our findings further suggest that *racial identification* among Hispanics is related to heterogeneity of health status among Hispanics.

Moreover, we find that foreign-born Hispanics, many of whom are from the Caribbean or Central American nations, possess a very similar health profile as non-Hispanic blacks born in the Caribbean/West Indies. This is generally consistent with theories of immigrant selectivity since Hispanic blacks, like non-Hispanics from the Caribbean/West Indies, originate from countries that are in close proximity to the US. However, there are some differences in reported health of foreign-born Hispanics versus the other immigrant groups. For example, foreign-born Hispanics reported higher physical activity limitation in the census compared to the other foreign-born groups. Additionally, foreign-born Hispanics reported the lowest level of hypertension among the foreign-born. These differences may be a function of variation in selective forces by country of origin as well as linguistic and cultural differences in response to survey questions.

This study has several limitations. First, measures of health are self-reported. Normative perceptions of health and illness, which may vary by country of origin, may influence responses to survey questions. Thus differences in reported health status by nativity and place of birth may not accurately represent true differences in underlying health status. We attempted to measure a broad set of health indicators that encompass multiple dimensions of health including functional loss, self-rated health, and medically defined conditions, and we found similar patterns across all measures. Furthermore, because reporting of chronic health conditions may be influenced by access to health, we examined whether controls for a physician visit within the last year influenced our results, and found them to be robust for inclusion of this variable. Future research in this area would benefit from objective measures of health such as clinical and biological markers (e.g. blood pressure, cholesterol, inflammatory markers) and mortality by cause of death. Second, despite the pooling of several waves of the NHIS the sample for some immigrant groups remained very small and limited our ability to draw firm conclusions. Third, our results with respect to age and year of immigration are based on cross-sectional data and thus they should be interpreted with some caution. Future research on acculturation and health trajectories of immigrants over time would benefit from the use of multiple cross-sections or longitudinal data that make it possible to follow immigrant cohorts over time after their arrival in the United States. In addition, multigenerational studies of black immigrants and comparison with populations in countries of origin would help shed light on the impact of the US environment on the health of black immigrant subgroups. Finally, we did not examine whether differences in residential segregation patterns among the native-born and foreign-born blacks are associated with the variation in health outcomes. This area merits further investigation.

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APPENDIX

Table A.1. Descriptive Characteristics for Black Native-born and Foreign-born US residents Ages 25+; 50 States and the District of Columbia, National Health Interview Survey (NHIS) (percentages, unless otherwise noted)

	Native-born		Foreign-born			
Characteristic	Hispanic	Non-Hispanic	Hispanic	West Indian/ Caribbean/ South American	African	European
Mean age	41.0	46.8	42.7	45.3	39.7	37.3
(*standard deviation*)	(11.2)	(11.4)	(10.1)	(9.7)	(7.1)	(8.8)
Sex						
Female	55.2	55.6	51.7	55.8	41.7	46.8
Male	44.8	44.4	48.3	44.2	58.3	53.2
Educational attainment						
Less than high school	26.7	22.4	38.4	17.4	7.4	4.6
High school	26.8	32.0	24.6	30.4	17.1	22.1
Some college	21.6	20.4	14.8	16.7	16.8	22.0
College degree	18.3	20.1	17.7	29.4	39.7	38.1
Graduate education	6.6	5.2	4.5	6.0	19.0	13.2
Marital Status						
Never married	30.2	28.0	20.9	23.6	23.2	37.2
Married	47.8	41.9	54.9	54.2	61.1	40.1
Separated/divorced/widowed	30.1	22.2	24.2	22.1	15.8	22.7
Region of Residence						
Northeast	44.7	12.6	42.1	57.0	25.4	27.0
Midwest	13.9	19.4	4.8	2.0	19.6	11.6
South	27.9	60.9	37.7	37.9	44.7	49.2
West	13.6	7.1	15.5	3.1	10.3	12.2
Smoking						
Never Smoker	58.7	58.6	81.4	83.8	81.0	69.8
Former Smoker	17.6	16.7	8.8	8.1	11.0	8.2
Current Smoker	23.8	24.6	9.7	8.0	8.0	22.0
BMI						
Obese ($\geq$30 kg/m^2)	38.3	37.0	22.0	23.7	18.2	32.4
Sample Size, (*N*)	304	22,241	283	1,485	574	93

Note: Sample characteristics are based on weighted data. The number of cases is unweighted.
Percentages may not add up to 100 due to rounding.
Source: The NHIS adult sample files, 2000-2006.

Table 1. Descriptive Characteristics for Black Native-born and Foreign-born US residents Ages 25+; 50 States and the District of Columbia, Census of Population 2000 (percentages, unless otherwise noted)

	Native-born		Foreign-born				
Characteristic	Hispanic	Non-Hispanic	Hispanic	West Indian/ Caribbean	African	European/ Canadian	Other non-Hispanic
Disability Measures							
Physical activity limitations	14.4	15.2	9.0	7.4	3.6	6.5	9.4
Personal care limitations	5.9	5.7	3.4	3.0	1.3	2.5	3.3
Mean age	42.1	46.4	44.6	45.7	39.5	37.9	45.0
(standard deviation)	(14.5)	(15.6)	(14.3)	(13.9)	(10.5)	(11.1)	(15.7)
Sex							
Female	53.2	55.1	50.7	56.1	43.5	55.7	53.7
Male	46.8	44.9	49.3	43.9	56.5	44.3	46.3
Age at immigration							
< 20 years	NA	NA	30.9	28.7	14.6	65.7	43.3
20-54 years	NA	NA	65.7	67.3	82.3	33.7	53.4
55+ years	NA	NA	3.5	4.0	3.1	0.7	3.3
Year of Immigration							
1990 or later	NA	NA	31.6	24.5	55.1	19.6	21.4
1980 – 1989	NA	NA	32.3	37.2	30.1	20.8	22.9
Before 1980	NA	NA	36.1	38.3	14.8	59.6	55.7
Educational attainment							
Less than high school	29.1	27.4	42.9	29.8	14.1	9.6	22.5
High school	26.2	30.1	21.8	27.0	19.2	19.4	22.1
Some college	23.0	23.0	16.7	18.5	18.8	27.0	22.9
College degree	16.4	14.8	13.2	19.3	31.1	31.9	24.0
Graduate education	5.4	4.6	5.4	5.5	16.8	12.1	8.5
Marital Status							
Never married	31.8	27.8	21.4	22.9	22.2	33.4	24.2
Married	35.2	37.1	45.4	47.6	50.3	41.7	45.8
Separat./divor./widowed	32.9	35.1	33.2	29.5	27.5	24.9	30.0
Region of Residence							
Northeast	42.6	14.8	50.4	58.2	30.0	27.7	33.5
Midwest	11.2	19.6	4.8	2.8	15.7	11.5	9.3
South	30.7	56.1	30.9	35.4	39.9	42.5	34.9
West	15.4	9.5	13.9	3.6	14.5	18.3	22.3
Sample Size, (*N*)	8,603	827,613	7,942	50,198	17,181	3,326	2,863

Note: Sample characteristics are based on weighted data. The number of cases is unweighted.
Percentages may not add up to 100 due to rounding.
Source: The 5% PUMS file of the 2000 U.S. Census of Population.

Table 2. Odds Ratios from Logistic Regression Predicting Limitations in Physical Activity and Personal Care: Black Native-born and Foreign-born US Residents Ages 25+, 50 States and the District of Columbia, Census of Population 2000 (N=917,726)

	Physical Activity Limitation		Personal Care Limitation	
Characteristic	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Place of birth				
(non-Hispanic native-born)				
Native-Born Hispanic	1.24***	1.20***	1.38***	1.32***
Foreign-born Hispanic	0.60***	0.57***	0.67***	0.63***
West Indies/Caribbean	0.45***	0.47***	0.55***	0.58***
African	0.34***	0.41***	0.41***	0.50***
European/Canadian	0.68***	0.78**	0.79	0.91
Other non-Hispanic	0.58***	0.63***	0.59***	0.65***
Age at Immigration (native-born)				
<20 years	0.50***	0.57***	0.69***	0.79***
20-54 years	0.43***	0.46***	0.49***	0.53***
55+ years	0.58***	0.53***	0.68***	0.62***
Year of Immigration (native-born)				
1990 or later	0.37***	0.36***	0.48***	0.46***
1980 – 1989	0.45***	0.47***	0.56***	0.58***
Before 1980	0.51***	0.57***	0.58***	0.65***

*** p<.001; ** p<.01; * p<.05

Source: The 5% PUMS file of the 2000 U.S. Census of Population.

Note: Reference group for each characteristic is given in parenthesis. Estimates are based on weighted data.

Model 1: Bivariate relationships (adjusted for age and sex only). Separate models are estimated for place of birth, age at immigration, and year of immigration.

Model 2: Fully adjusted models (Model I + education, marital status, and region of residence). Separate models are estimated for place of birth, age at immigration, and year of immigration.

Table 3. Odds Ratios from Logistic Regression Predicting Limitations in Physical Activity and Personal Care: Black Foreign-born US Residents Ages 25+, 50 States and the District of Columbia, Census of Population 2000 (N=81,510)

	Physical Activity Limitations			Personal Care Limitations		
Characteristic	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Place of birth (West Indies/Caribbean)						
Foreign-born Hispanic	1.36***	1.22***	1.24***	1.21**	1.08	1.10
African	0.84**	0.97	1.03	0.79**	0.93	0.95
European/Canadian	1.66***	1.62***	1.69***	1.50**	1.39*	1.54**
Other non-Hispanic	1.28**	1.27**	1.28**	1.05	1.03	1.05
Age at Immigration (20-54 years)						
<20 years	1.32***	1.33***	NA	1.52***	1.57***	NA
55+ years	1.07	0.95	NA	1.20*	1.08	NA
Year of Immigration (1990-2000)						
1980 – 1989	1.23***	NA	1.31***	1.16	NA	1.23**
Before 1980	1.26***	NA	1.44***	1.13	NA	1.29***

*** p<.001; ** p<.01; * p<.05

Source: The 5% PUMS file of the 2000 U.S. Census of Population.

Note: Reference group in parentheses. Estimates are based on weighted data.

Model 1: Bivariate relationships (adjusted for age and sex only). Separate models are estimated for place of birth, age at immigration, and year of immigration.

Model 2: Fully adjusted model: age, sex, and place of birth, age at immigration, education, marital status, and region of residence.

Model 3: Fully adjusted model: age, sex and place of birth, year of immigration, education, marital status, and region of residence.

Table 4. Selected Health Outcomes among Black Native-born and Foreign-born US residents Ages 25+; 50 States and the District of Columbia, National Health Interview Survey (NHIS) (percentages, unless otherwise noted)

Characteristic	Native-born		Foreign-born			
	Hispanic	Non-Hispanic	Hispanic	West Indian/ Caribbean/ South American	African	European
Health Measure						
Fair/poor self-rate health	15.8	20.6	14.2	13.1	6.1	4.6
Hypertension	19.3	37.7	15.4	28.0	16.7	23.9
Serious medical condition[a]	20.4	23.0	14.1	15.1	8.4	8.7
Physical activity limitation	22.4	26.3	15.9	16.0	9.0	6.8
Sample Size, (*N*)	304	22,241	283	1,485	574	93

[a] Cancer, coronary artery disease, heart disease, heart attack, diabetes, stroke, or emphysema
Note: Sample characteristics are based on weighted data. The number of cases is unweighted.
Source: The NHIS adult sample files, 2000-2006.

Table 5. Odds Ratios from Logistic Regression Predicting Limitations in Physical Activity, Poor/Fair Self-rated Health, and Presence of Hypertension and Serious Medical Conditions: Black Native-born and Foreign-born US Residents Ages 25+, 50 States and the District of Columbia, 2000 (N=24,980)

	Physical Activity Limitation			Poor/Fair Self-Rated Health		
Place of Birth	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Place of birth (non-Hispanic native-born)						
Native-Born Hispanic	1.14	1.12	1.13	0.94	0.91	0.91
Foreign-born Hispanic	0.66*	0.61**	0.75	0.78	0.67	0.82
West Indies/Caribbean/S. American	0.55***	0.60***	0.73***	0.62***	0.68***	0.82*
African	0.46**	0.58*	0.72	0.37***	0.52*	0.64
European	0.37**	0.43*	0.45*	0.31*	0.39*	0.41+

	Hypertension			Serious Medical Condition[a]		
Place of Birth	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Place of birth (non-Hispanic native-born)						
Native-Born Hispanic	0.49**	0.52**	0.49**	1.22	1.19	1.17
Foreign-born Hispanic	0.33***	0.34***	0.39***	0.69+	0.65+	0.80
West Indies/Caribbean/S. American	0.67***	0.73***	0.85+	0.64***	0.65***	0.80*
African	0.52***	0.56***	0.65**	0.49**	0.52**	0.62*
European	1.01	1.10	1.12	0.61	0.65	0.69

*** p<.001; ** p<.01; * p<.05; + p<.10

[a] Cancer, coronary artery disease, heart disease, heart attack, diabetes, stroke, or emphysema

Source: The NHIS adult sample files, 2000-2006.

Note: Reference group for each characteristic is given in parenthesis. Estimates are based on weighted data.

Model 1: Bivariate relationships (adjusted for age and sex only).

Model 2: Model 1 + education, marital status, and region of residence.

Model 3: Model 2 + smoking and obesity.